SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

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Ph.D. Synopsis
In the Subject Chemistry

Topic

"Synthesis, Characterization, Microbial activities of Novel Dithioketene & their Derivatives"

Submitted By

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Submitted To

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Proposed Research Work

Synthesis, Characterization, Microbial activities of Novel Dithioketene & their Derivatives.

1. Introduction:

Freund in 1919 synthesized ketenes[1]ketene dithioacetals have been used as an intermediate in synthetic organic chemistry. There are several reactions for this; they have a widely used for theirpotential. The Sulphur atom exercises a stabilizing effect on neighboringpositive as well as negative charges.[2,3]this makes the double bond in ketene dithioacetals responsive towards both nucleophilic as well as electrophilic attack, an extremely useful feature for organic synthetic purposes.

Some years ago, the methods of preparation, the physical and chemical properties of these ketene derivatives and their use in organic synthesis, were reviewed.[4]The literature, until 1978, was related to no functionalized ketene dithioacetals.

2. Review of Research and Development in the Subject:

Push–pull alkenes, which bear electron donating and accepting groups at both terminal of C=C double bond respectively, are of interest not only for their unique electronic properties but also for their importance as versatile building blocks in organic synthesis. In the world of ketene N, S-acetal compound was reported in 1956. N, N – acetal[5,6] have been widely studied and reviewed.

Ketene N, S-acetal, which possesses structural features that enable the olefinic linkage to be activated by electron – releasing alkylthio and amino groups through p-π conjugation, are more reactive toward electrophiles than ethylene.

Cyclic ketene N, S- acetal compounds, for instance, ralitoline and etozolin, have been registered as drugs in treatment of neurological and hypertension diseases. [6,7] in recent yearslong with increasing reortson the chemistry of keteneS, S, acetal as an active area in push- pull alkenes. According to Halls bond forming initiation theory[8] based on the increasing donor ability of alkenes in the sequence, in general, the nucleophilic reactivity of the carbon adjacent to the acetal moiety.

The reactivity and flexibility of a wide variety of functional groups and substituents in ketene N, S –acetal and equivalents allows them not only to act as a N- and or C – nucleophile but also to act as C_2 1, 2- diols

In 1964, Gomer and Elser[10].Described the first example of synthesis of ketene N, S-acetal from thioamides bearing a secondary amino group by reaction with methyl iodide followed by base – mediated deprotonation. The elecrohilicity of the carbonyl and

cyanogroup at the acceptor end of ketene N, S – acetal makes them potentially reactive sites toward a nucleophilic center. A series of N- methyl acyl cyclic ketene N, S- acetals can be obtained under mild reaction conditions. Thiazoles are readily available 11, 12 and are useful starting materials for the synthesis of cyclic ketene N, S- acetal.

Intra molecular cyclization reactions of ketene N, S- acetal enable the synthesis of N-unsubstituted pyrroles.

This review was intended to provide comprehensive coverage of the chemistry of ketene N, S- acetal, which in turn enabled us to find that, in the world of acetal having the push-pull alkene skeleton, ketene N, S- acetal is most likely the biggest family according to the number and types of ketene N, S-acetal compounds.

3. Objectives of Research

The proposed investigation includes the novel synthesis, Characterization and microbial activities of dithio-ketene & their derivatives by conventional as well as green approach which is used for further preparation of derivatives containing various heterocycles. This will lead to find out some potent lead compound for the microbial activity.

A. Synthesis of newer ketones.Newer ketones containing pyridazine moieties were prepared. Aromatic ketone was prepared from 3, 6- dichloro pyridazine and3-amino acetophenones using glacial acetic acid.

B. Reaction of newer ketones withcarbon disulphide to yield .ketene

C. Reaction of Ketene withsubstituted amino benzothiazole to (E(- 3- (benzo] d. thiazol-2-ylamino(pyridylprop-2-en-one.

D.Reaction of Ketenewith substituted o- phenylene diamine to 2(1,3- dihydro-2*H* 1,3-benzimidazole-2-yliden(pyridyl-2-en-one

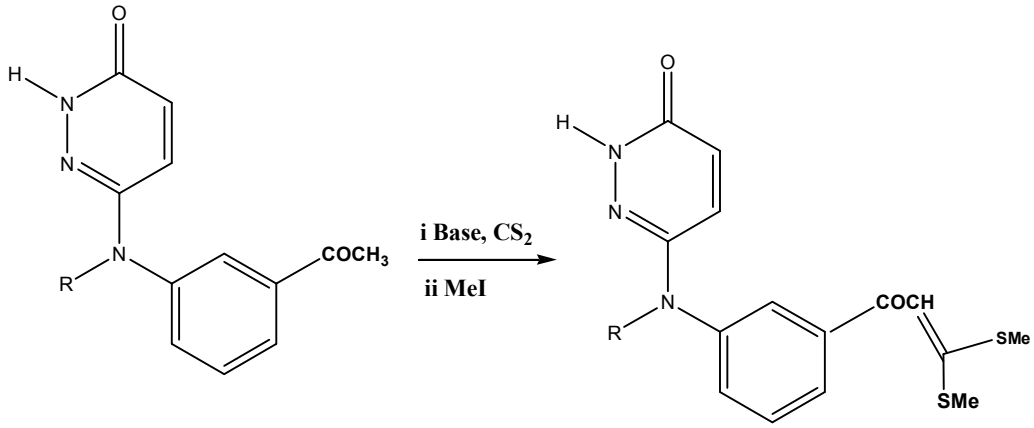
E. Reaction of Ketene with substituted 2- amino pyridine to obtain imidazopyridine.

F. Reaction of ketene with hydrazine and phenyl hydrazine to obtain pyrazoles & substituted pyrazoles.

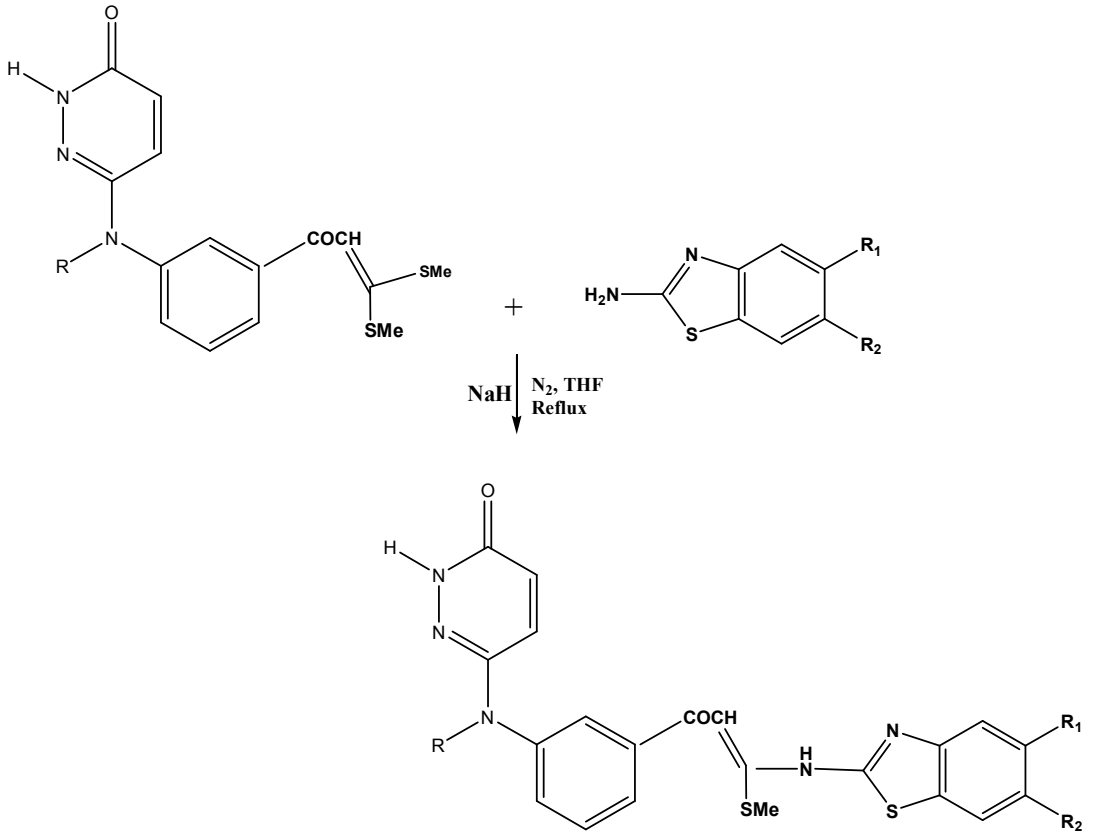
G. Biological Activity Study of these newer ketene and Heterocycles derived from theses ketenes.

4. Methodology to be adopted:

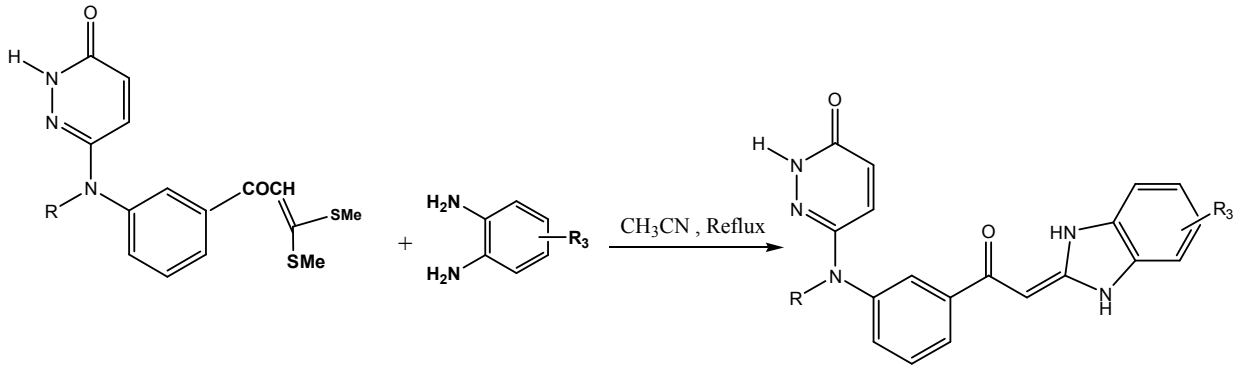
A. Reaction of newer ketones withcarbon disulphide to yield .ketene



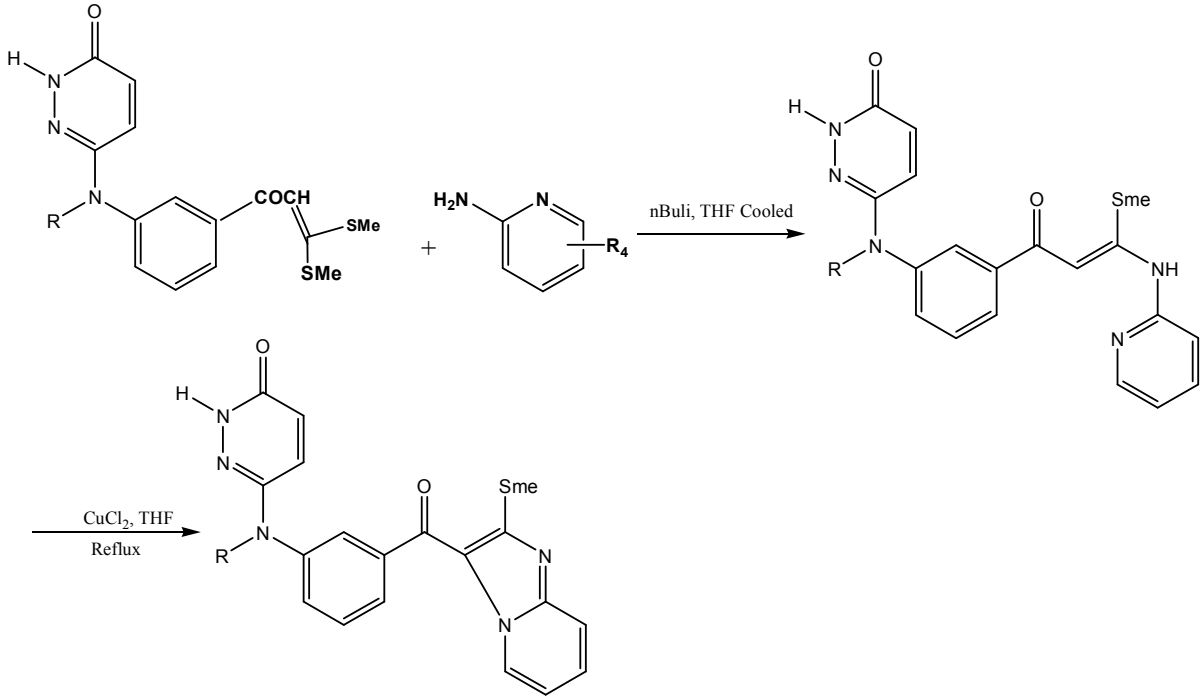
B. Reaction of Ketene with substituted amino benzothiazole to (E(- 3- (benzo] d. thiazol-2-ylamino(pyridylprop-2-en-one.



C. Reaction of Ketene with substituted o- phenylene diamine to 2(1,3- dihydro-2*H* 1,3- benzimidazole-2-yliden(pyridyl-2-en-one.



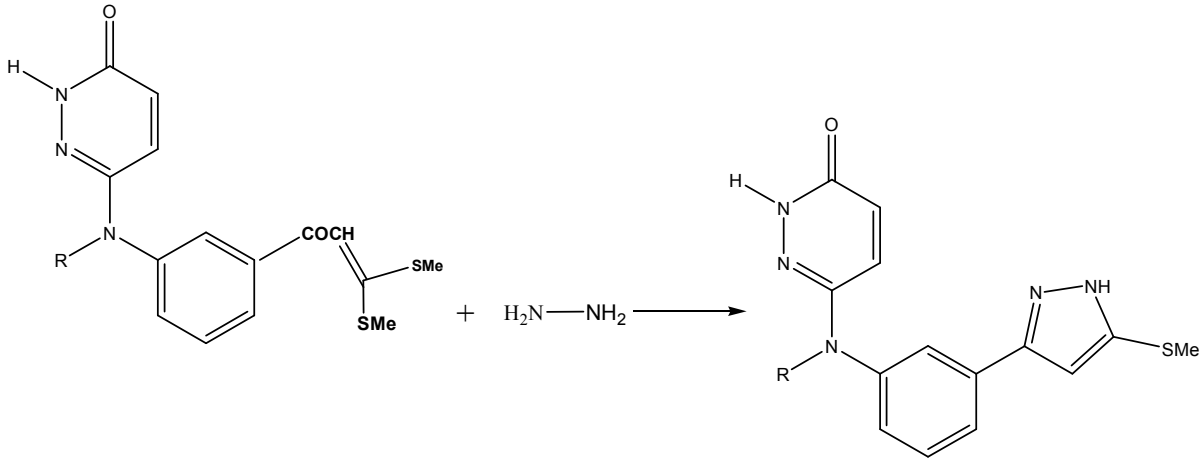
D. Reaction of Ketene with substituted 2- amino pyridine to obtain imidazopyridine.



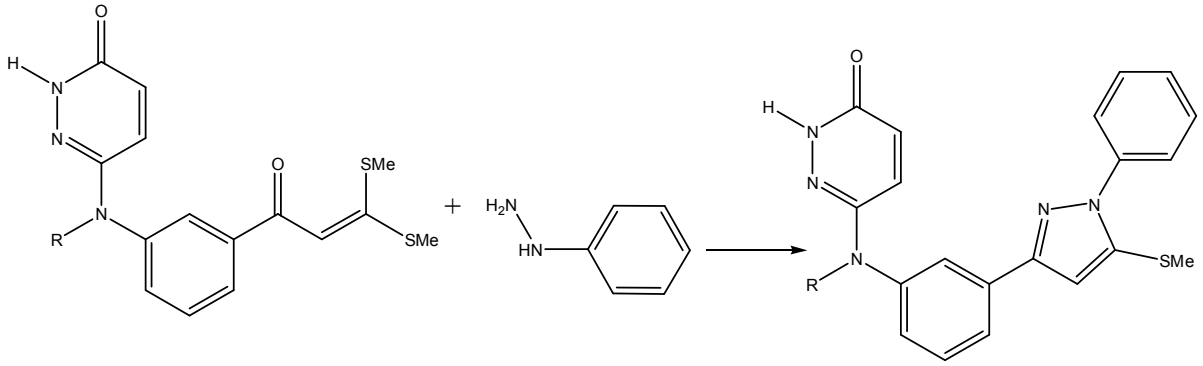
E.Reaction of Ketene with hydrazine & phenyl hydrazine's to obtain pyrazoles

Reaction of ketenes with hydrazine & phenyl hydrazine leads to the formation of pyrazoles.

a. Hydrazine



b. phenyl hydrazine



F. Biological Activity Study of these newer ketene and Heterocycles derived from theses ketenes All synthesized novel ketenes and their derivatives have great biological activities therefore all synthesized compounds are screened for biological activities. .

5.Importance of Study society application:

i. International Status: The proposed work is synthesis of various newer ketene and their derivatives will subject for microbial activity screening. Thus the work is related with chemistry, biology and medicinal uses. Its have international status. Many of the N, S- acetal cyclic ketel S, S- acetal was found to show medicinal uses.

ii. National status: It is revealed that, many research groups were working on ketel and their derivatives. It is because of intermediate nature of Ketel. Dithioketene were found different medicinal uses.

iii. Significance of the study: The proposed investigation includes the synthesis of ketene by conventional as well as by green approach which are used for further preparation of derivatives containing various heterocycles e.g. benzothiazoles, thiazoles, benzimidazole, benzoyridines etc. This will lead to find out some potent lead compound for the

antibactaricidalvasorelaxant activity, anti-diabetic, antimicrobial as well as anticancer activity.

6. Proposedwork plan

First Year: A. 1-6 Months: Order of Chemicals and Glassware's as well literature survey torelated work.

B. 7-12 Months: Synthesis of Ketene and characterization of these compounds.

Second Year:C. 13- 18 Months: Reactions of theseketene withdifferent reagents to

D. 19-24 Months: Biological Activity Study of these newly synthesized compounds.

Third YearE. 25-36 Months: Publications and report writing of research work ..

7. References:

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